1156-92-405 **Alessandro Vespignani***, Northeastern University, Boston, MA 02115. *Modeling and forecast of epidemics in structured populations.*

The data science revolution is finally enabling the development of infectious disease models offering predictive tools in the area of health threats and emergencies. Analogous to meteorology, large-scale data-driven models of infectious diseases provide real- or near-real-time forecasts of the size of epidemics, their risk of spreading, and the dangers associated with uncontained disease outbreaks. These models are not only valuable because they predict where and how an epidemic might spread in the next few weeks, but also because they provide rationales and quantitative analysis to support public health decisions and intervention plans. At the same time, the non-incremental advance of the field presents a broad range challenges: algorithmic (multiscale constitutive equations, scalability, parallelization), real time integration of novel digital data stream (social networks, participatory platform for disease monitoring, human mobility etc.). I will review and discuss recent results and challenges in the area, ranging from applied analysis for public health practice to foundational computational and theoretical challenges. (Received January 28, 2020)